My preliminary discussion of the first observations received indicated that the meteor penetrated to a point so low in the air that it probably fell in the region twenty miles west of Manchester. This conclusion was mentioned in a letter to the Manchester papers, and the discovery of the meteorite a few miles west of Wigan fully justified the prediction. Several of the observers say that the object lost its luminosity when still at an apparently considerable height. This appears to show that the motion had so far slackened that combustion had visibly ceased, and the object fell to the ground in an opaque, cooling condition. Evidence of this is also furnished by its penetrating the soil to a depth of only 18 in. Several well-observed meteoritic falls have been of merely terrestrial velocity amounting to 400 or 500 ft. a second, which is something different from the velocity of 26 miles a second possessed by these bodies in planetary space. The descent of objects of this class is often vertical or nearly so, and their original velocity and direction are apparently quite changed by the new conditions impressed on them during their disruption when very near the earth's surface.

I have collected a large number of observations of the flight of the object, from which it appears that its direction was from about azimuth 335°, counted west from south, or from S.S.E. to N.N.W., and the probable radiant was at $348° + 2°$ in the western region of Pisces. The course of the meteor was from near Stoke to the place of its fall, a length of 49 miles traversed at a velocity of about 8 miles a second. The height declined from 29 miles to 0.

The object is said to have made a slanting hole in the ground, and this would accord with an angle of some 37°, which a radiant at $348° + 2°$ would indicate. But the angle of the meteor's descent must have probably become much steeper after its entry into our atmosphere as an effect of the resistance encountered and terrestrial attraction. Several disruptions of its material undoubtedly occurred before the final outburst; these reduced the size and varied the shape of the object and may well have influenced the line of flight.

The radiant in Pisces yields many fireballs in September, and one was seen by many observers on September 8 last. Daniel's comet of 1907 has an orbit which approaches near the earth's orbit on September 12 and may possibly be responsible for some of the large meteors observed in September and at a later period.

Previous meteoric falls have occurred as follows in England, and I give the last recorded case in Ireland:—

1795 December 13, Wold Cottage, 56 lbs.
1830 February 15, Launton.
1835 August 4, Aldsworth.
1876 April 20, Rowton, $7\frac{3}{4}$ lbs.
1881 March 14, Middlesbrough, $3\frac{1}{2}$ lbs.
1902 September 13, Crumlin, Ireland, $9\frac{1}{2}$ lbs.

W. F. Denning.

NOTES.

A course of twelve Swiney lectures on geology will begin on Saturday, November 14, in the lecture theatre of the Victoria and Albert Museum, South Kensington, by Dr. J. D. Falconer, who will take as his subject, "Land Forms and Landscapes." There will be no charge for admission to the course.

M. Boutroux, member of the Institute of France, and professor in the University of Paris, has accepted an invitation of the British Academy to deliver the first of the recently endowed annual philosophical lectures. His subject will be "Certitude et Verité," and the lecture will probably be delivered early in December next.

Announcement is made that the Serbian Government is in immediate need of the services of qualified bacteriologists and physicians experienced in the treatment of epidemic diseases. Conditions of service and remuneration will be made by arrangement. Applicants should communicate with the Secretary of the Serbian Legation, 195 Queen's Gate, London, S.W.

A sharp earthquake was felt over the whole of northern Italy at 10.20 a.m. (9.20 Greenwich mean time) on October 27. The scanty reports which have appeared in the newspapers show that it was sensible from Venice to Elba, and from Turin to Ancona—that is, over an area of not less than 70,000 square miles. The epicentre was apparently near Lucca, or between that city and Bologna.

Col. W. B. Bryan, who, as chief engineer of the Metropolitan Water Board, had much to do with the improvement of the London water supply, died suddenly on October 27. Col. Bryan was to have delivered the Thomas Hawksley lecture on "Pumping and other Machinery for Waterworks and Drainage," before the Institution of Mechanical Engineers on Friday last, but the lecture has now been cancelled.

Dr. F. B. Power will retire from the directorship of the Wellcome Chemical Research Laboratories on December 1, in order to return to the United States of America. His period of service dates from the foundation of these laboratories by Mr. H. S. Wellcome in the spring of 1896. Dr. Power will be succeeded by Dr. F. L. Pyman. The character and policy of the Wellcome Chemical Research Laboratories will continue as in the past.

A Reuter message from Stockholm reports that the Swedish scientific institutions which have to award the Nobel prizes in December have decided, in view of the European situation, to postpone the distribution of the prizes for 1914 for literature, medicine, chemistry and physics until next year. It is now proposed to hold the formal presentation of the prizes every year in the month of June instead of on December 10, the anniversary of M. Nobel's death, when the awards will merely be announced.

A general discussion on the hardening of metals has been arranged by the Faraday Society, to be held on Monday, November 23, at the Chemical Society, Burlington House, London, W. The president, Sir

Robert Hadfield, will preside over the discussion, and among those who will take part therein are Prof. Ernest Cohen, of Utrecht, Dr. G. T. Beilby, Prof. J. O. Arnold, Prof. H. C. H. Carpenter, Dr. C. H. Desch, Prof. C. A. Edwards, Mr. H. L. Heathcote, Mr. J. C. W. Humfrey, Dr. T. M. Lowry, Mr. Andrew McCance, Dr. W. Rosenhain, and others.

THE Dorset Field Club will award in May next the "Cecil" medal and prize of 10*l.* for the best paper on radium: its present position, supply, and cost; with any recent discoveries on its curative effects. The competition is open to any person between the ages of seventeen and thirty-five on May 12, 1914, who either was born in Dorset or had on the date mentioned lived in the county for the preceding twelve months. Further particulars may be obtained from Mr. H. Pouncy, the *Chronicle* Office, Dorchester.

BY the will of Mr. W. Erasmus Darwin, eldest son of Charles Darwin, the Royal Society of London is bequeathed the sum of 1650*l.*; his nephew, Mr. C. Galton Darwin, receives the portraits of Charles Darwin by Lawrence and Ouless, as well as Darwin's medals, Royal Society's candlesticks, snuff-box, christening mug, autobiography, notebook on children, two early sketches of "The Origin of Species," two vols. of "Hooker's Correspondence," the family Bible, the old Dutch brass-bound box containing the family papers, large silver soup tureen, the counterpane worked with the coat-of-arms, the letters written home from the *Beagle,* and pictures and miniatures. The desire is expressed that these relics should always be kept in the family.

A RESEARCH prize of the value of 200*l.* has been placed by Sir Robert A. Hadfield, past president, at the disposal of the Iron and Steel Institute, to be awarded by the council for original research work on the different combinations of carbon in iron, steel, and alloys of iron with other elements. It is proposed that the prize shall be awarded at the annual meeting of the institute in May, 1916, for the best report presented before February 1, 1916. Sir Robert Hadfield is prepared to offer a second prize for the report next in merit to that which gains the first prize provided it is adjudged to be really meritorious. It is suggested that the work should be in continuation of, or based upon, the work of previous investigators. The object of the prize is to stimulate the study of carbides in iron and iron alloys generally, also with a view of discovering the best method of determining the forms and combinations in which carbon occurs in iron and steel. It is desirable to define the composition of these combinations more accurately and to ascertain whether other carbides exist which have hitherto not been identified. The study of the molecular constitution of the carbides will also fall within the range of the investigation. It is hoped that the results obtained will throw much light on the cause of hardness of steel, also on the nature and form of carbon combinations with iron and its alloys. Intending competitors should communicate, in the first place, with Mr. G. C. Lloyd, secretary of the Iron and Steel Institute, 28 Victoria Street, London, S.W.

Science of October 16 contains a memorial notice of the late Dr. Theodore Nicholas Gill, who died in Washington on September 25, in his seventy-eighth year. Although originally a law-student, Gill at an early age directed his attention to zoology, and in the winter of 1857–58, an expedition to the West Indies for the purpose of collecting shells and other natural history objects afforded him an opportunity of turning his inclinations to practical account. This was succeeded by a visit to Newfoundland in 1859, and in the following year he signalised his special interest in ichthyology by the preparation of a report on the fishes of the northern boundary for the U.S. State Department. Of wider interest was his catalogue of the fishes of the eastern coast of North America from Greenland to Georgia, published in 1861, of which a revised issue appeared in 1873. This and other works laid the foundations of his revised classification of fishes, which has been taken up and elaborated by Dr. D. S. Jordan and other American ichthyologists, and, according to the notice in *Science,* has now been accepted by European students of ichthyology. It must not, however, be imagined that Gill's work was restricted to fishes; on the contrary, it was unusually wide, embracing such diverse subjects as West Indian molluscs, the classification of mammals, and zoogeography. In 1861 Gill was accorded the chair of zoology at the Columbian (George Washington) University, Washington, a position he held until 1910, when he became emeritus professor.

SIR ERNEST SHACKLETON left Buenos Ayres for South Georgia on October 27 to carry on his trans-Antarctic enterprise. In a message to the *Daily Chronicle* of October 29 he announced some changes in the plans of the expedition. Instead of the *Endurance* returning to South Georgia and Buenos Ayres, after landing the members of the expedition, as was originally intended, she will winter in the Antarctic. Sir Ernest stated that on arrival at South Georgia all the dogs will be landed on one of the small islands of the group and left ashore. The geologists of the staff will also remain at South Georgia. The *Endurance* will then proceed south to examine the pack-ice and see whether it is loose enough to go into without unnecessary delay. After an examination of the pack the *Endurance* will return to South Georgia to pick up the members of the expedition and the dogs. The *Endurance* will be coaled to her fullest capacity, and, proceeding south again, will push right into the pack, keeping as much eastward as possible, in the hope of meeting more open water than is probably to be found further westward. Sir Ernest hopes to winter the vessel in 77·30° S. latitude, and if this point is gained at a sufficiently early date the transcontinental journey may be started this season. Should the ice conditions be too unfavourable, the journey will not be begun until October of 1915. The Argentine Government has provided the expedition with a wireless receiver, with which it will be possible to receive communications and time signals while the expedition is in the Antarctic.

IN the September number of *Folk-Lore* Miss C. S. Burne continues her valuable studies of the geographical distribution of British folk-customs. In this paper she deals with the customs known as souling, clementing, and catterning, practised in parts of the western midlands in November. They exhibit an example of successive layers of imported custom superimposed on a foundation of indigenous custom. First come the ancient, almost prehistoric, autumnal celebrations of the Old and New Year, probably always combined with a Feast of the Dead. Then Christianity transforms the pagan feast into the festival of Hallowmass. Next we meet with that combination of newly introduced subsidiary cults with newly organised and specialised crafts, which marks the progress of civilisation in the Middle Ages. Thus St. Clement and St. Catherine come into local prominence. Finally comes the period of decay, when the theological changes of the sixteenth century shatter the religious side of the kindly old customs, while simultaneously the centralising despotism of succeeding centuries and a civilisation growing more and more complicated deprive these rites, once so important, of any real significance, and they dwindle away or are kept up only by the most conservative part of the population, the children, wherever their elders allow them to benefit by them.

IN *Ancient Egypt* (part iv.) Prof. Flinders Petrie concludes his instructive review of the analogies between the culture and beliefs of ancient Egypt and those of certain African tribes. Such analogies are indicated by royal functions, beliefs, and material products. Among the royal functions attention is directed to the widely spread African customs in connection with the priesthood of the chief, his removal before he attains old age, and the concealment of the fact of his death; in sister marriage; in the importance assigned to the royal placenta, the leopard skin, and the ox tail; and in the use of the saw-fish as an emblem. Among beliefs we find similar analogies in the conception of the mundane spirit world; animism; the ancestral spirit; the roads for the dead; the ideas about twins, animal or human; the ram-headed god; the bull god; totemism and animal clans; the sanctity of the sycamore and the fig-tree; the sacrifice of red cattle; and divination by objects thrown. Egyptian culture, again, is connected with that of other parts of the continent by its pottery, mud toys, wooden head-rests, the wooden hoe, double process spinning, the use of the flat ground-loom, mosquito-nets, harpoons, drag and hand nets, basket traps, ring snares, and the ornamentation of the head by means of a cone. Individually these analogies may be of slight importance, but their cumulative effect is considerable. These various transfers of culture seem to have taken place in at least three periods: under the twenty-fifth dynasty at Napata, in the sixth century B.C., and after the introduction of Christianity.

PART 3 of vol. vii. of the Journal of the College of Agriculture, Tohoku Imperial University, is devoted to a synopsis of the Japanese chrysopid Neuroptera, with descriptions of several new species, by Mr. H. Okamoto. In connection with this may be mentioned a catalogue of books on entomology, chiefly from the library of the late Mr. Herbert Druce, issued by Mr. F. Edwards, High Street, Marylebone, W.

LIFELIKE photographs of grey-lag geese and of a specimen of the greater courlan (*Aramus giganteus*) recently received at the London Zoological Gardens form some of the most striking features in the October issue of *Wild Life*. The reader should, however, not have been left in the dark as to the native home of the courlan, and the attention of the editor may be directed to the need of greater care in proof-reading, as exemplified by the repetition on p. 32 of the statement that the sand-lizard is a slow mover, and of the substitution of "specimens" for "species" in the middle of p. 34.

INVESTIGATIONS carried on by Mr W. E. Collinge with the view of ascertaining the nature and quantity of the food of nestling sparrows have shown that in fruit-growing districts one hundred of these birds will consume nearly 2000 insects, and in suburban neighbourhoods about one-third of that amount. That sparrows are far too numerous is fully admitted; but it is suggested that if their numbers were considerably reduced they might be included in the list of benefactors. This and other information on the subject will be found in the October issue of vol. xxi. of the Journal of the Board of Agriculture.

AN excellent piece of systematic work is formed by Mr. A. H. Howell's revision of the so-called American harvest-mice, constituting the genus Reithrodontomys, published by the Smithsonian Institution as No. 36 of the *North American Fauna*. These mice, of which no fewer than fifty-five distinguishable forms are recognised, are chiefly a North American type, although the group also ranges through Central America to the northern States of South America. In the main essentially field-mice, they are in most districts only moderately numerous, although in a few they make their appearance in large numbers. As a rule, they do little harm, feeding for the most part on plants of no value to man.

IN *Symons's Meteorological Magazine* for July last Mr. L. C. W. Bonacina asked readers who had been in India whether lightning casualties, notwithstanding the severity of tropical storms, are not much rarer there than with us. He pointed out that many persons agree that thunderstorms in England are much more dangerous than in India. In the issue for October a correspondent ("G. G.") states that in the course of his travels in various parts of India, during a period of several years, he had only known or heard of one case of death by lightning, although a few high buildings, notably near Delhi, and tall trees in mountain districts, had been struck. He therefore answers Mr. Bonacina's question in the affirmative, the reason given being that thunderstorms occur higher up in the air. He states that he has never seen lightning in India so near the earth as he has in England.

DURING this summer experiments have been made with Langley's original "aerodrome" of 1903, and have proved that this scientifically designed pioneer machine is capable of flight with precisely its original propulsive plant, wings, and rudders, and with 40 per cent. extra aggregate weight due to floats and their attachments. An account of these experiments is given in the *Scientific American* for October 10.

MESSRS. G. MICHAUD and F. Tristan, writing in the *Scientific American,* describe photographs and observations on the absorbing power of different flowers for invisible light. They find that the majority of flowers come out dark when photographed in ultra-violet light, but that a certain number of yellow flowers reflect the ultra-violet rays in a marked degree. In the case of the Compositæ this property is only exhibited by the exterior corollas. On the other hand, most flowers of any colour appear to reflect infra-red light to an equal degree.

IN the *South African Journal of Science* for September (vol. x., 14) Mr. Pedro Luis de Bellegarde da Silva advocates the use of wireless telegraphy in connection with the surveying operations now in progress in the province of Mozambique. At present these operations involve considerable delay owing to the peculiar nature of the country, and it is suggested that a distributing station at some place, such as Lourenço Marques together with small portable wireless outfits would enable the survey to determine the longitudes of many points in the province with greater expedition and accuracy than is possible with the present use of chronometers.

"THE Propagation of Disturbances in Dispersive Media" forms the title of No. 17 of the "Cambridge Tracts in Mathematics and Mathematical Physics," by T. H. Havelock (Cambridge University Press, 1914; pp. viii+87; price 3*s*. 6*d*. net). In it the author applies Fourier analysis to investigate the changes of form of a disturbance propagated in a medium in which the wave velocity is a given function of the wave-length. The theory of groups of waves of the most general type is thus discussed, and applications to optical problems are considered.

PART 213 of the Proceedings of the American Philosophical Society contains a paper by Prof. A. E. Kennelly and Mr. H. S. Sanborn, read before the society on April 24, which gives the results of a research carried out at Harvard University in 1911 on the effect of air pressure on the heat carried away from a hot wire by an air current blowing across it. In the original experiments of Prof. Kennelly and his pupils in 1909 it was shown that the watts which had to be spent in the wire to keep its temperature constant (400° or 500° C.) when air blew across it at a speed v between 200 and 2000 cm. per sec. varied as $\sqrt{v}$, but at lower speeds as $\sqrt{v+30}$. As Boussinesq in 1901 showed that the heat loss should also vary as the square root of the density of the fluid used, the present observations were made in a tank at various pressures, and it was found that for pressures above atmospheric the law held, but at lower pressures the power of the density was more nearly 0·4. They conclude that the constant of their heated wire wind velocity measurer or anemometer requires to be corrected for both temperature and pressure of the air. The effect of moisture in the air appears, however, to be small.

FOR many years there has been periodical agitation for the construction throughout the country of large granaries in order that there might be no possibility of a famine in the event of war. So far as the war has gone, the pressure of the Navy has shown that those who contended in favour of absolute ensurance of the command of the sea, in preference to such tentative measures, were right. Nevertheless, the immense granaries, which are increasing in number at our great shipping ports, are welcome on account of the facilities they afford for the discharge and distribution of grain, and for ensuring an adequate supply at the outset of war. The latest of these granaries, built by the Clyde Navigation Trustees at Glasgow, is described in *Engineering* for October 30. This granary has a total length of 312 ft., a width inside of 72 ft., and a total storage capacity for 31,000 tons of grain. While not so large as corresponding arrangements in Canada and the United States, the structural details of the Glasgow granary and the design of its machinery for discharging grain from ships and distributing it into and out of silos, are thoroughly representative of the best practice of the day, and of great and prolonged experience.

A LIST of the titles of English, American, French, and German medical and other scientific periodicals, together with prices of subscription, including postage to any part of the world, has been issued by Mr. H. K. Lewis, 136 Gower Street, London. Though only the leading publications are included, the list contains nearly 300 names. The periodicals published in Germany cannot be supplied during the war. The list will prove of particular service to librarians and of interest to medical men generally.

OUR ASTRONOMICAL COLUMN.

A NEW COMET.—M. Bigourdan communicates to the *Comptes rendus* for October 27 (vol. clix., No. 17) the substance of a telegram received from M. Comàs Solà, director of the Fabra Observatory, Barcelona, recording the discovery of a comet in a region of the sky recently occupied by Encke's comet. Its position on October 25 at 16h. mean Barcelona time is given approximately as R.A. 11h. 27m., and declination +50° 36′, and the movement is in a south-south-east direction at the rate of 5° a day. The comet is stated to be visible with a pair of opera-glasses.

THE COMET RECENTLY OBSERVED AT THE CAPE.—In this column on October 8 (p. 151) we recorded the appearance of a bright comet observed at the Royal Observatory, Cape Town, and published an ephemeris up to October 13, computed by Mr. Wood, of Johannesburg. The comet was stated to be fading, and at the same time to be rapidly decreasing its southern declination. This object has now been recorded from Barcelona, where it was photographed on October 17 last (*Comptes rendus,* vol. clix., No. 16, October 19). The note by M. Comàs Solà, presented by M. Bigourdan, to the French Academy, records its position as being R.A. 21h. 53m. 12s., declination −3° 14 at 8h. 9m., Barcelona mean time, the place